

The Trade-off between Liberalization Policy and Financial Crises Dynamics

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Abstract

In this paper, we attempt to check the extent to which a quick and a rushed liberalization process is a determining and an explanatory factor of financial crises. With reference to the state space model and Kalman filter technique, we were able to elaborate a new measure of financial openness for the South East Asian countries. This measure is first used to raise the financial openness pace already ill-adapted by these countries during the 1997 crisis. Second, we created a measure of financial instability during the (1990-2008) period. The results led us to the conclusion that a rapid liberalization process may be a crises-provoking factor. Ten years later, the international financial sector has been hit by a major financial crisis. Some southern Mediterranean countries have been relatively spared the ordeal. Applying these measures on the Tunisian context, we reached the conclusion that a moderately-paced liberalization process is a way of avoiding devastating financial situations.

Keywords: Openness pace, Financial instability, Crises, Financial liberalization

1. Introduction

Recently, capital flows towards developing countries have remarkably increased. This increase results from the decrease in international interest rates and the economic recession that the developed and capital-exporting countries are witnessing. During the last two decades, developed countries initiated an openness process of their capital accounts in order to attract foreign capital and subsequently to remedy the weaknesses of domestic savings potential. This process has been tackled sensitively different from emerging countries. Some have won the openness process while others have known huge flops and even some crises. (Komulainen and Lukkarila, 2003; Daniel and Jones, 2007; Ben Gamra and Plihon, 2008; Shehzad and Hann, 2008; Okpara, 2010).

Wachtel (2001), Ben Gamra and Plihon (2008), and Umutlu et. al (2010) observe that in the case of a barter economy, it is unlikely to have banking or exchange crises. Financial instability thus occurs only in monetarised and liberalised economies. Yet, no country can avoid the monetary and financial spheres and consequently all kinds of financial instability. The proliferation of the recent crises has strengthened financial instability. Nevertheless, the analysis of this notion remains unsystematic and only few researchers like Guillaumont and Kpodar (2004), Loayza and Ranci ere (2004) and Eggoh (2010) have considered financial instability. Currently, there is no clear and precise definition for financial instability in the economics literature. Economists, however, agree that financial instability is the absence of financial stability, without which growth is crippled. (Allen and Wood, 2006; Alawode and Al Sadek, 2008).

Despite their importance, conclusions drawn from previous generations of crises models remain unsatisfactory in explaining emergence of new crises. The last subprime crisis of 2008 had devastating and unprecedented repercussions. World economy is threatened once again. Several authors find some common characteristics between this crisis and previous generations of crises, yet new unobserved aspects can be signalled. This led some economists to label a new generation of crises: the fourth generation. (Claessens et. al, 2010).

Then, this paper tries to answer whether financial liberalization is a source of financial instability and crisis? Distinguishing between a gradual openness mode and the Big Bang mode, we try to attest for whether an "optimal" pace of capital account openness helps countries avoid financial crises?

The interest given to the Asian crisis not only results from the fact that it is an identical crisis across these

countries, but also from the fact that the South East Asia countries enjoy an efficient and performing growth model. The question to be answered then is: How did that happen?

Hong et. al (2010) note that the Asian crisis started in July 1997 when the Thai Baht outperformed the US dollar and extended to an international monetary recognition. Thailand witnessed an overinvestment crisis fed by the private sector, and secured by a growth in production capacity.

The investments were primarily oriented towards low-profit operations, real estate, creating a real estate bubble. Capital efficiency decreased and real estate-oriented credits resulted in an accumulation of bad debts. Furthermore, a large proportion of the private sector's debt was insecurely changed into foreign currencies, putting local operators into vulnerability against change risk. Finally, indebtedness was contracted in the short-run to finance long-term projects creating a payment risk (half of it within less than a year).

For some authors, mainly Chung (2003) and Lee and Shin (2008), the main reason of the Asian crisis rests on an ill-managed openness towards foreign capital. Foreign capital benefited from all the incentives to invest in the "Asian miracle". This capital flow came along a spectacular increase in the private sector's indebtedness in several Asian countries. It is in this line of thinking that Stiglitz (2000) notes that "liberalization of capital accounts is the most important factor behind the Asian crisis genesis". However, for others the absence of a common and even a unique currency between these countries and their high level of dependency on the dollar are other reasons to consider. (Lim Mah-Hui and Maru, 2010).

The instability of South East Asia which started in Thailand is firstly a monetary crisis as the massive capital entries resulted in inflation increase, with the currency becoming ultimately overvalued. The deficiency of the local currency would provoke a capital flight phenomenon, causing a financial bubble explosion leading to stock markets crash. Moderated by the snow ball effect, this deficiency intensified and provoked the depreciation of other Asian currencies. The financial situation of banks and firms would quickly worsen as these latter were in the short-run highly indebted in foreign currencies (dollar and yen). Then, facing such a situation, the authorities would let the currencies float with serious repercussions on stock markets because assets became very volatile. Consequently, instability intensified and South East Asia plunged into a chaotic situation. The other international stock markets were soon affected by the Asian instability and the crisis grew international. (Lee and Shin, 2008; Hong et. al, 2010; Lim Mah-Hui and Maru, 2010).

Ten years later, the international financial scene is under the shock of a major financial crisis. Provoked by the securitization of bad debts, resulting from the American real estate bubble, the crisis, also known as the subprime crisis, exploded in the summer of 2007. It was characterized by a decrease in real estate values and by a domino effect which made large banks all over the world crash and share prices dwindle down. Central banks, mainly the European Central Bank and the Federal Reserve Bank, contributed in maintaining liquidity (Ricol, 2008). The implementation of a rescue plan for the United States known as the US Paulson Plan, and other measures undertaken in Europe were not efficient enough to restore trust. A crash of international stock markets took place in October 2008. The inter-bank market is totally paralyzed with elevated interest rates and a generalized trust crisis. The non-financial economy became closer to the crisis. US pensions lost 2000G\$ in one year. (IMF, 2010).

This paper is organised as follows. In the second section we attempt to answer whether financial liberalization is a source of instability and this by referring to the literature on the subject. The third section presents the experience of the countries which adopted capital account openness such as the South East Asian and southern Mediterranean countries, for which we create in the fourth section a new measure of capital control. The fifth section treats the degree and pace of openness comparing the Asian and Tunisian models using a financial instability measure. The sixth section draws some conclusions.

2. Financial Instability, banking and capital flows control: literature revue

Studying financial liberalization and banking crises, Aizenman, (2001), Chung (2003), Wilmarth (2004), Tornell et.al (2004), Ranciere et. Al (2006), Daniel and Jones (2007) Lee and Shin (2008), Jonung (2008), Ben Gamra and Plihon (2008), Lim Mah-Hui and Maru (2010) and Angkinand et. Al (2010) suggest that financial liberalization may induce financial instability and banking crises. This would make the financial system unable to finance the real economy. Consequently, decrease in capital investments and innovation prevail.

Kaminsky and Reinhart (1999), studying a sample of 25 countries, find out that financial liberalization may lead to banking crises. This negative impact only prevails during the three or four years immediately following the liberalization process. Then, the positive effect emerges. During the 1970s, the South East Asian countries' experiences of financial liberalization came along a high increase in banking deposits and growth. However,

during the late 1970s and 1980s other similar experiences in Turkey, Philippines and other Latin American countries, namely Argentina, Chile and Uruguay, ultimately failed. This liberalization policy saw an increase in the real interest rate for capital entries and ended in drastic balance of payments crises of the banking systems. In a volatile and an instable macroeconomic environment, banks are expected to take excessive risks which may end up in financial crises at times of an instable economic period. Other things being equal, the financial system becomes instable and likely to be threatened by crises when it develops, risking a slackening of economic growth.

According to Stiglitz and Weiss (1981), when facing uncertainty, banks tend to limit their interest rates and rationalise demand for credits in order to avoid risk aversion and incite customers to take risks once credits are granted. Mackinnon (1988) forwarded this hypothesis to explain financial crises which hit Latin America during the 1970s then in Turkey and Philippines. Still, according to Mackinnon (1988) for the developing countries where the institutional environment is weak and where a banking monitoring system is absent and where macroeconomic uncertainty prevails, investors tend to morally behave. They tend to opt for risky projects with excessively elevated interest rates and to undertake change risks with the idea that in a healthy economic context, these investments will make high profits whereas in the opposite case this would lead to borrowers' bankruptcy. The banking systems' high losses will be taken in charge by the monetary authorities or by international financial institutions. In the same line of thinking, Stiglitz (1985) believes that information inequality between investors resulted in a stowaway behaviour. Still, Stiglitz assumes that imperfect market conditions lead to a bad adjustment of savings to investment. This state of affairs tends to raise crises risk. In this context, Mehrez and Kaufmann (1999) assume that low-transparency and highly-corrupt economies are more likely to be threatened by financial instability. To test this hypothesis, Mehrez and Kaufmann used data from a sample of 53 countries during the 1977-1997 period. They concluded that the probability of a banking crisis diminishes when there is a low corruption level.

Using a sample of 53 countries during the 1980-1995 period, Demircuc-Kunt and Detragiache (1999) test the impact of financial liberalization on banking vulnerability. They show that banking crises are very likely in a liberalized financial system. Their findings point to a significant and positive relationship between financial liberalization and banking crises probability. However, financial liberalization effect on banking vulnerability is minimum in the case of a solid institutional environment. Institutional quality is operationalised by GDP per capita, law enforcement, bureaucracy and corruption. The regression results yielded positive and very significant relationships between financial liberalization and institutional variables. Their findings corroborate the thesis that a solid institutional environment with low levels of corruption may reduce the negative effect of financial liberalization on banking crises. Likewise, Rachdi (2010) notes that a financial liberalization policy undertaken in an under developed institutional environment characterized by its poor banking supervision is likely to enhance proliferation of banking crises. The author's conclusions are based on the application of a multivariate logit on a sample of 12 emerging countries during the 1980-2003 period. Angkinand et. al (2010) find out a U-shaped relationship between liberalization and the likelihood of crisis. Indeed, the results of a study of a 48-country sample over the 1973-2005 period point out that the strength of capital regulation and supervision determines the relationship between liberalization and banking crises. Accordingly, with very weak regulation and supervision, the probability of banking crises increases with liberalization. In other words, the better the quality of regulation and supervision is, the probability of likelihood of crises decreases with liberalization.

Stock markets growth may as well moderate some of these risks, yet it may intensify the real effects of these shocks. In this line of thinking, Dellas and Hess (2005) assume that a boosted financial development tends to make emerging stock markets more sensitive to external financial and macro-economic influences. Accordingly, the effects of external shocks may transfer to the real activities through stock markets. Financial channels are additional ways through which shocks may be transferred. Overall, the authors agree on the fact that a solid financial context reduces sources of instability. Differently put, financial liberalization may not degenerate when some external conditions are absent. When the fundamentals of a given economy are vulnerable, that economy is likely to undergo a financial crisis if investors re-evaluate investment risk in that country or seek to balance their portfolios because of a crisis in another country. Inconsistent with a number of studies which explained crises from an empirical and macroeconomic perspectives, Miotti and Plihon (2001) favour an explanation based on macroeconomic elements. The authors assume that banking crises in some emerging countries are essentially explained by the presence of an excessive speculative risk. Miotti and Plihon (2001) made it clear that deficient banks are those witnessing high levels of profitability generated from speculation operations before the crisis. Kamulainen and Lukkarila (2003) reach the conclusion that among the 31 emerging countries studied, the vulnerability to crisis is higher within contexts involving large liabilities, which triggered sudden capital

outflows. Daniel and Jones (2007), who examine the reasons of financial crises, note, among other things, that poorly designed banking system often lead to financial stress. The authors join Pesola (2005) in their conclusions. Chung (2003) notes that in the South East Asian countries, banks have changed, creating wide gaps between political authorities and bank managers. When investors trust in the support of monetary authorities and in the financial and banking systems started to be shaken, foreign investors decided to reduce their commitments towards these countries, mainly by selling their stocks. This scenario led to a change and a financial crisis mutually feeding on each other: depreciation of change rate raised the value of banks' indebtedness in local currency, which forced banks to sell their portfolios to secure their need for liquidity. This move induced a decrease in stock costs, reinforcing foreign investors' retreat, launching thus change rate depreciation.

Lim Mah-Hui and Maru (2010) note that capital international flows are a source of risk for world economy, mainly for Singapore which they studied. Several financial crises affecting developed and emerging countries succeeded during the last two decades. They have more important macroeconomic costs than the 1980s debt crisis. For instance, in Mexico in 1995, in Thailand, South Korea and Malaysia in 1998, the Gross Domestic Product (GDP) decreased by 7% provoking a wave of unemployment and social problems. These crises are fed with the new practices adopted by financial markets agents. These new practices, based essentially on indebtedness to finance economic activities, resulted in the creation of new interconnections between financial markets and unstable countries. Wilmarth (2004) cautions that financial instability may be accompanied by instability of real and financial assets prices. This phenomenon is known as financial bubbles. Assets price bubbles initiate with a financial liberalization or a decision of raising economy-targeted credits issued by a central bank. The resulting credit growth leads to an increase in assets prices which feed on the financial bubble. Then, the bubble explodes and prices crash, creating bankruptcies of the firms or the economic agents having borrowed money in order to purchase assets with inflated prices. A banking or a change crisis may follow. Thus, financial instability starts with a financial crisis. This phenomenon may compromise the good functioning of the financial system by diminishing trust in financial institutions, leading to a decrease in savings and resulting in capital flights. Vulnerability associated with capital flights, a large proportion of credits granted to the private sector and an increase in credits positively affect banking crisis occurrence probability. Ben Gamra and Plihon (2008) underline that the impact of financial liberalization policy on the banking system stability highly depends on liberalization modalities. The degree, priorities and rhythm of this latter may influence banking crises. A study of 22 emerging countries over the 1970-2002 period confirmed this thesis.

Tornell et.al (2004), Rancière et. al (2006), Lee and Shin (2008) discussed the effects of liberalization policy on the one hand on banking crises and on the other hand on economic performance in terms of economic growth. Tornell et. al (2004) prove that for emerging countries trade openness often comes with financial openness. This latter may provoke financial vulnerability and leads to a greater incidence of crises. Likewise, the positive effect on economic growth is strongly felt. Applying their econometric model on a sample of 60 countries over the 1980-2002 period, Rancière et. al (2006) conclude that the direct effect of financial liberalization on growth by far outweighs the indirect effect via a higher propensity to crisis. Similarly, Lee and Shin (2008), in a study conducted on a sample of 58 countries over the 1980-1999 period, note that the direct positive effect of liberalization dominates the indirect negative effect of the crisis.

3. South East Asian and Southern Mediterranean countries' (Note 1) experience with financial openness and crises

The massive entry of foreign capital because of the deregulation measures undertaken since the mid-1980s contributed in accelerating the Asian countries' economic growth. Nevertheless, foreign capitals during the 1990s are distinguished by capital flows representing a large proportion of the 1980s debts. Foreign direct investments have become the rule, followed by portfolio investments representing essentially pension funds and common Anglo-Saxon placement funds looking for higher returns. Business credits and development-oriented public aid became less visible.

The massive entry of capitals in these countries induced an increase in the monetary base and triggered a very rapid rhythm of credit allocation. When a non-resident purchases a non-banking financial asset, the seller (a resident) receives currencies that find their way into a local bank when changed into local currency. In its turn the bank changes currencies with the central bank and the transaction creates an increase in the reserves/deposits ratio of the commercial bank. This latter has an additive effect on credit whether by an increase in the deposits or by an increase in the reserves of the central bank. The effect on the monetary base is the same whether for direct investments, portfolios or bank credits. Consequently, interest rates have been systematically increased in order to moderate these tendencies. The deviation between the practiced interest rate in the industrialised countries and in the Asian countries has widened provoking an important increase in foreign capitals and in credits faster than

the GDP. Abundance of liquidity pushed banks to easily grant credits for projects whose profitability is questioned. We should note that in Thailand and Malaysia the credit/GDP ratio exceeded the 100% in 1995 and 1996.

The second half of the 1980s saw an important increase in change reserves, mainly in Korea and Thailand due to the openness of capital markets. In order to avoid losing the competitiveness-price of exports, an administered management of change rates has been adopted by Korea and Thailand.

Evolution of the real change rate indicates an appreciation of currencies in relation to the dollar and provokes an external deficit. The current balance is deficient during the two decades, except for the second half of the 1980s. This deficit is due to an investment level higher than domestic savings. The high level of investment maintained since the beginning of the 1990s did bring about enough improvement in the industries competitiveness. Most Asian countries witnessed an increase in social and income costs without being able of producing capital. It is rather an investment in less profitable sectors such as the real estate. Since 1996, these countries have met some difficulties in external markets. The persistence of the elevated deficiency contributed in losing trust in the currencies of these countries and in capital flights which led to a loss of change reserves. This consequently provoked an important depreciation of local currencies in relation to the dollar moving from 20% to 70% between June 1997 and January 1998. By the end of 1997, Thailand, Indonesia and Korea found themselves bankrupt. They asked the help of the IMF and other international financial institutions, like the Asian Development Bank, the World Bank and the Bank of International Settlements. Other countries as well contributed in the Asian countries rescue plan like the US, Japan, Singapore, Australia and other European countries. Table 1 summarizes the aid amounts in million dollars granted to Asian countries. Although the amounts are important, they do not seem enough if we consider the commitments of these countries; the short-term indebtedness of South Korea and Indonesia exceeds the 150 million dollars, whereas that of Thailand is near the 100 million dollars. For the Asian countries, the transition from a banking crisis to a liquidity crisis may be explained by a weak banking system resulting from weak prudential rules. The non-banking financial system, being immune from financial authorities' control, remained untouched.

Some southern Mediterranean countries have relatively avoided the crisis. In Tunisia and although the financial sphere avoided the repercussions of this crisis, the economic activity, highly open on the exterior, developed thanks, on the one hand, to the high international prices of consumer goods, like energy and cereals during the first quarter of 2008, and on the other hand, to the decrease in the external demand for the major exporting sectors like textile and clothing and the mechanical and electrical industries.

The Tunisian economy achieved a growth rate of 4.6% in 2008 against 6.3% a year later. Besides the stability of external exchanges, this growth is explained by the robustness of internal demand, mainly household consumption and private investment, specifically with the important flow of Foreign Direct Investments (FDI) made possible by the reforms undertaken and the improvement of the business environment.

The direct effect of the financial crisis on Tunisia is very limited because of some reasons. Indeed, Tunisia has a relatively closed capital account. The financial sector is known to be very close with the absence of a freely convertible currency and a liberalized capital account. The second reason relates to the strictly regulated securitization. The Tunisian financial institutions do not excessively use techniques known to be at the origin of the crisis and the gap between the real and financial spheres like the structured securitization techniques of the Mortgage Backed Securities, the Credits Default Swap or the Collateralized Debt Obligations because local banks' placement of their resources in foreign currencies on the international financial markets obeys strict rules. Note as well that the stock market is highly regulated. For the Tunis Stock market, the impact is very limited knowing that foreign market capitalisation is 25% in 2008 held by referenced shareholders and not by financial investors, which lent some stability and shielded the economy against contagion risks. Likewise, market capitalisation growth played an important role in this phenomenon, with the entry of important firms such as ARTES in April 2008, Poulina Holding Group in August of the same year and without forgetting the privatisation of STAR insurance company. Nevertheless, rates began decreasing starting from mid-September, yet lesser than other markets indices. Consequently, we saw the Tunis stock market index increasing by 17% between December 2007 and March 2009. A more important reason than the previously mentioned is that the mortgage scheme is unlikely to disturb the banking system. Mortgage rates are relatively lower compared to other more developed economies (10% of the GDP in 2008 against 90% in the US). Regulation of mortgaged credits is relatively very restrictive with a placement of fixed interest rates for loans exceeding 15 years. Finally, we draw attention to the presence of control of refinancing risks. In 2008, nearly 80% of the external debt is long-term, of which 70% is bound with multilateral and bilateral creditors and about 77% of the external short-term and long-term debt has been contracted with fixed rates. Moreover, stock reserves largely cover

short-term commitments, representing 150% of the short-term debt. Worth noting is that the international financial crisis had no significant effects on Tunisia's financial situation. Its impact will be mainly sensed at the level of the real economy which slowed down in the Euro zone, Tunisia's main exportation market.

4. A new measure of capital control

The issue of degree of capital account openness was subject to numerous theoretical and empirical discussions. We try to provide an openness index for some South East Asian emerging countries basing ourselves on an approach favouring the degree of non correlation between investment rate and savings rate as a good measure of a perfect capital movement. In this regard, Feldstein and Horioka (F-H, 1980) looked at evaluating international capital mobility on the basis of the relationship between investment and savings of the OECD countries. The idea is that in a country with weak capital mobility, all domestic savings will be used to finance domestic investment, whereas in a country with high capital mobility, domestic savings will be used to finance highly-profitable investment opportunities in the international market.

Although previous empirical studies assumed a stability of the relationship between investment and domestic savings, our contribution consists in operationalising this relationship. The oil shocks, the financial crises and the geo-political upheavals are considered as origins of the temporary instability of fundamentals and mainly transfer mechanisms. Temporary instability of the F-H specification induces us to opt for the state-measure models so as to generate a time-evolving control index.

To this effect, we used Brown, Durbin and Evans' Cusum test (Note 2) which represents a formal test of the model's instability allowing us to use the Kalman Filter. (See figure 1 to 4 for the Asian countries). Table 2 reports the instability of the regression of investments on savings. Then, we will examine a model with variable parameters linearly linked to exogenous variables.

The dynamic structure of the coefficients allows us the introduction of a sophisticated estimation technique, currently favoured in econometrics and which responds perfectly to our research problem. It is the Kalman Filter technique. Thanks to this technique we are able to show that the structure of the economy as described by the savings/investment relationship is a dynamic structure that depends on the degree of capital account openness. It may be expressed by the difference between the interest rate, the current deficit and change reserves.

Our space-state model is written as follows (Note 3):

$$\text{Measure Equation: } I_t = Z_t S_t + U_t \quad (1)$$

$$\text{State Equation: } Z_t = c_1 Z_{t-1} + c_2 Dti_{t-1} + c_3 Dti_t + c_4 Dc_{t-1} + c_5 Dc_t + c_6 R_t \quad (2)$$

S_t is the national savings rate

I_t is the national investment rate

Dti is the interest rate difference

Dc is the current deficit

R denotes change reserves

For South Korea, we have substituted the variable savings rate (S_t) with the (savings + aid + reserves)/GDP ratio noted by (Ω_t). Table 3 shows that the South East Asian region did benefit from investment financing through capital entries: Z_t reached its lowest values in Korea and Indonesia (0,55) and in Malaysia (0,64). With the 1997 financial crisis, the coefficient registered an important fall in Thailand since 1999, in Indonesia since 1998, in Korea since 1992 and in Malaysia since 1997. Starting from 2000, the slight increase in the Z coefficient in Korea induced a decrease in the country's indebtedness level. The rapid growth and industrialisation of these countries rest primarily on massive investments which were initially financed by higher internal savings then, following the crisis, by a request for foreign savings. (See figures 5 to 8).

Supported by the International Monetary Found, investment liberalization is a systematic alternative of the rescue policies. Reforms are very significant in Korea (Note 4) and Thailand which remained behind in terms of preferences and efforts of locating foreign investors in Asia, up till the crisis broke loose. Following the crisis, in addition to a decrease in stock prices, financial and banking liberalization in Thailand and Korea attracted foreign firms whose investments accelerated recovery. Thus, mergers and acquisitions (M&A) represented 60% of FDIs in the five economies hit by the crisis in 1998 and 80% in 1999, compared to the less than habitual 20% (see table 4). By contrast, changes are very limited in Malaysia as it is placed among the first destination of investments in Asia in 1990 thanks to the generous financial encouragements implemented by the Association of Southeast Asian Nations (ASEAN) such as the absence of constraints on capital and profits repatriation and on

royalties transfer.

FDIs played a twofold role in soothing economies hit by the crisis. First, FDIs contributed in financing economies suffering from a lack of credits and constrained by a destruction of their production potential. In the long-run, gradual openness to FDIs allowed for an increase in markets contestability and a progress in the way management and financing is done.

For the case of Tunisia, we first start by estimating the F-H equation linking investment and savings on the 1980-2006 period, using an Ordinary Least Square technique. The following is the equation:

$$I_{i,t} = a + bS_{i,t} + e_t \quad (3)$$

Where $I_{i,t}$ is the domestic investment rate, $S_{i,t}$ denotes the savings/GDP ratio and e_t is the error term. The

estimated equation is:

$$I_{i,t} = -0,35 + 0,66S_{i,t} \quad (4)$$

(-0,74) (2,02)

The CUSUM test result points to the instability of the regression of investment on savings (i.e. the b coefficient in equation 3) for the Tunisian economy, as the variable in question exceeds the confidence level (see Figure 9).

In order to estimate the dynamic structure of the coefficient b, we use Kalman Filter technique which expresses the relationship between savings and investment by the degree of capital openness represented by the difference between interest rate and current deficit. We retain the following space-state model (Note 5):

$$\text{The measure equation: } I_t = Z_t S_t + u_t \quad (5)$$

$$\text{The State equation: } Z_t = c_1 Z_{t-1} + c_2 Dti_t + c_3 Dc_t + V_t \quad (6)$$

We transformed the variable «b» into «Z», where Z_t denotes the state variable, supposedly unobservable.

I_t : (*Investment/GDP*) ratio

S_t : (*Savings/GDP*) ratio

Dti : interest rates difference

Dc : current deficit

In Table 5, we note that the coefficients of the variables Dti and the current deficit are significant and positive in explaining variable Z , inconsistent with the theory. This result may be explained by not checking the uncovered interest rates parity. An increase in the national interest rates raises sensitivity between national investment and domestic savings. However, we expect that an increase in Dti attracts capital flows. The increase in the current deficit positively affects the coefficient linking investment with savings, yet we predict a negative effect. Moreover, the estimated value of the Z coefficient is high (0,88) and approximates 1. This shows the slow or the very gradual pace of external financial liberalization. Thus, the government often keeps restrictions on capital account transactions. Financing investment remains linked to national savings.

The financial openness pace adopted by the Tunisian economy is gradualism. We note a decrease in the control level of capital flows at the beginning of the 1980s, followed by a sustained increase up till 1988. This increase may be explained by the adoption of the Structural Adjustment Program (SAP) in 1986 and the measures aimed at protecting the Tunisian economy from foreign competition.

From 1989 till 1992, control levels have progressively diminished. Worth noting is that in 1992, Tunisian authorities officially announced the current convertibility of capital account for the non-residents. Nevertheless, we note a return to controls till 1997, the date at which Tunisia was labelled as “partially close”, i.e. among the countries where regulations concerning the entry and exit of capitals require the authorization of the state. Knowing that a financial openness index of 0 indicates totally close and an index of 2 indicating complete openness, Tunisia’s index is 1,39 compared to Egypt’s 1,81 (Francesco, 2001). Starting from 1997, controls

continuously kept decreasing thanks to a partial liberalization of portfolio investments (PI). Foreign investments contribution in Tunisian firms no longer needs prior agreement of the Central Bank.

Since the 1990s, the decrease in Z_t is the result of the rapid growth of long-term capital flows and FDIs. Portfolio Investments have known as well an increase following Arab partners' contribution in the capital of some mixed and newly-created institutions and firms, mainly development banks. We witness as well a dynamic and a modern stock market and an increase in foreign contributions in national banks capitals. A case in point is the selling of the International Union of Banks (UIB) public shares to the French «Société Générale». (See figure 10).

5. Openness pace and financial instability: measure and analysis

Within the economics literature, authors gathered to define the positive concept of financial instability, a topic which started to attract the attention of international institutions beginning from the mid-1990s. Financial instability may be considered as the absence of financial stability, which implies an accurate definition of financial stability. According to Kose et. al (2006), there are two main schools. The first adopts a “systematic crisis” view of financial instability and highlights the resistance of the financial system. According to this view, bankruptcy of one bank is not necessarily a sign of instability. Mishkin (1997) notes that a financial system is stable when it is able to insure in the long-run and without problems an efficient placement of savings in investment. The second school considers financial instability as a succession of more or less regular periods of growth and credit absorption and generally of financial development indicators. Thus, these authors define financial stability as a situation with no banking crises and with a stability in the price of assets. The advantage of this definition is that it is directly verifiable and operational, yet its limit is that absence of banking crises is no indicator of the banking system's health. The distinction between the two schools is not dichotomous as a systematic crisis is often considered as an extreme manifestation of financial instability. With reference to these two schools, Alawode and Al Sadek (2008) distinguish two different methods of financial instability measurement:

- An indicator of systematic crisis. The occurrence of a systematic crisis is simply measured by a dummy variable which takes the value of 1 during the years of a financial crisis and the value of 0 during the other years. (Caprio and Klingebiel, 2003).
- An indicator of financial instability measuring irregularities of financial development. The deviation of the financial development indicator from a long-term pattern is the measure. However, the problem of the currency arises, in that there are several sub-types of indicators that depend on whether the selected pattern is linear, stochastic, mixed or computed as weighted moving averages.

Inspired by the work of Eggoh (2010) who adopted a measure based on standard deviation, we saw it fit to measure financial instability through computing standard deviations of the granted domestic credits in GDP percentage for the following countries: Indonesia, Thailand, Korea, Malaysia and Tunisia. We obtained the following results: (15.10) for Indonesia, (22.25) for Thailand, (16.23) for Korea, (37.73) for Malaysia and (3.26) for Tunisia.

These results are consistent with the idea that Tunisia is relatively less affected by financial crises and that the low degree of financial instability is in part explained by a gradual financial openness as shown above. The Asian countries register a high degree of financial instability. Malaysia is the most threatened, followed by Thailand and then Korea and finally Indonesia. These results are supported by the development of the series in question over the 1990-2008 period for the Asian countries and Tunisia reported above.

Finally, we should compute a correlation coefficient between the degree of financial openness described in the first section and the degree of financial instability. The aim is to point to the link between financial risk management and a good financial openness policy undertaken gradually like the Tunisian model. By contrast, an ill-managed financial liberalization pace resulting in an immature openness would provoke financial instability, as shown by our Asian sample.

6. Conclusion

In our study, we would like to outline that the trade-off between liberalization policy and financial crises is at the heart of the ambiguity noted in the literature. Yet, we draw a particular attention to the degree and pace of openness as the first to be considered in a case of crises amplification. The pace and speed of financial reforms consists in determining the time needed to end up capital account openness. In the case of a quick pace, all measures are taken jointly and the transition from a state of financial repression to a liberalization phase is done in a short term. This is the “big bang” phenomenon. In the case of a long process, measures are taken one by one

and openness is done in a gradual fashion.

If a partial liberalization seems to positively affect the economy, a complete and a synthetic liberalization accurately shows the limitations of its effects. To explain the ambiguity of these results, the literature seems to agree on the idea that liberalization needs prerequisites in terms of development level, institutional environment, or generally speaking political stability and respect for public freedoms. Nevertheless, securing these prerequisites provides no immunity from the risk inherent in finance.

After elaborating a new measure of financial openness in terms of capital control degree (Zt) and financial instability, we are able to confirm that an abrupt and ill-managed financial openness is the main factor behind the Asian crisis. By contrast, retaining Tunisia as a model of the countries which knew how to avoid the instability risk, this study proves that the gradual pace of financial openness, undertaken by Tunisia and measured by the Zt variable, helped this country avoid the negative effects of the current international crisis.

The worth of our paper resides in its focus on the effect of the modalities of financial reforms on crises likelihood. The analysis of the potential of financial liberalization in explaining crises occurrence allowed us, through studying the Asian (Korea, Thailand, Malaysia and Indonesia) and the Tunisian models, to conclude that the negative effect of financial liberalization in terms of financial stress depends on, among other things, the degree, chronology and pace of removal of restrictions on capital mobility. Our results are consistent mainly with those of Ben Gamra and Plihon (2008) who concluded that banking crises occurrence probability is higher when financial liberalization is faster. Meanwhile, we would like to point out that prioritising reforms in terms of sequences and requiring economic and financial pre-conditions are ingredients of a successful financial liberalization process (Jedidi and Mensi, 2010).

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Notes

Note 1. For the South East Asia region, we selected the following countries: Thailand, Indonesia, Malaysia and Korea. However, we were content to retain the case of Tunisia for the region south of the Mediterranean, given that Morocco has some features similar to those of Tunisia. In addition, Algeria has been ruled out, due to the occurrence of war and missing security such that they can distort our interpretations.

Note 2. The CUSUM of squares test, elaborated by Brown, Durbin and Evans (1975) allows the evaluation of the temporary stability of the coefficients of a linear regression. It is based on the cumulative sums of the squared residuals, given by:

$$s_t = \left(\sum_{i=k+1}^t u_i^2 \right) / \left(\sum_{i=k+1}^T u_i^2 \right) \quad \text{for } t=1, \dots, T$$

Where u is the recursive residual, obtained through the recursive estimation of the linear regression which includes the parameter's vector. Under the null hypothesis in which the model's parameters are constant, the S statistic follows a Beta law with a mean $(t-k)/(T-k)$ and framed by the corridor $\pm c + (t-k)/(T-k)$ where c is the Kolmogrov-Smirnov statistic. There is a temporary instability of parameters (reject the stability null hypothesis) if the statistic moves outside the corridor at a period t .

Note 3. For Thailand, the national savings rate and domestic investment are taken logarithmically.

Note 4. Before the crisis, FDIs low flows towards Korea are due to a selective policy of foreign investments, favouring investments in high technology sectors.

Note 5. All variables are treated by a logarithm except for D_c and D_t .

Table 1. Aid Amounts in 1997 (in million dollars)

	IMF	World Bank	A.D. B	Bilateral	Total
South Korea	21	10	4	22	57
Indonesia	10	5	4	19	38
Thailand	4	1,5	1,2	10,5	17,2
Philippines	2,4				2,4
All	37,4	16	8,7	51,5	111,6

Source: Finance Agency for Asia, Tokyo

Table 2. Characteristics of the (savings+aid)/GDP ratio in the regression of investment on savings

	Rate Coefficient (savings+aid)/GDP	CUSUM of squares test
MALAYSIA	0,12	unstable
THAILAND	0,63	unstable
INDONESIA	0,79	unstable
SOUTH KOREA	0,36	unstable

Table 3. Estimation of the model for the South east Asian countries

	Indonesia	Malaysia	Thailand	South Korea
C_1	0,958 (8,66)*	0,968 (54,76)*	1,027 (42,72)*	0,945 (113,79)*
C_2	0,086 (0,239)			
C_3		-0,73 (-1,24)	1,437 (4,49)*	
C_4				-0,663 (-0,988)
C_5	1,52 (1,17)	0,137 (0,245)		
C_6			-0,593 (-3,157)*	
Z_t	0,552 (24,64)*	0,644 (21,92)*	0,835 (39,19)*	0,552 ^{□□□} (29,42)*

Z_t is the coefficient of S_t ; Z_t is the coefficient of Ω_t

* Significant at the 1% level; ** significant the 5% level; *** significant at the 10% level

Table 4. Foreign Direct Investments

Mln \$ and in %	1996	1997	1998	1999
Annual FDI				
South Korea	2,3	3,1	5,2	10,3
Malaysia	7,3	6,5	2,7	3,5
Thailand	2,4	3,7	7,4	6,1
Of which M&A (%)				
South Korea	25	27	77	88
Malaysia	11	5	41	31
Thailand	10	17	43	30
FDI/Gross Fixed Capital Formation				
South Korea	1,3	1,8	5,5	7,4
Malaysia	17	15,1	13,9	16,2
Thailand	3,1	7,8	25,1	26,7

Source: CNUCED

Table 5. Estimation of the model for the Tunisian economy (1980-2006)

Tunisia	
C_1	0,940 (71,14)*
C_2	0,84 (2,40)*
C_3	0,65 (4,18)*
Z_t	0,88 (212,5)*

* Significant at the 1% level; ** significant the 5% level; *** significant at the 10% level

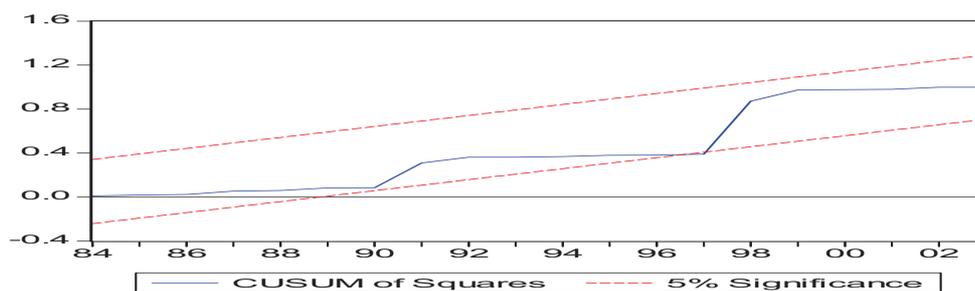


Figure 1. The «CUSUM of Squares » test of the degree of correlation between investment and savings for Indonesia

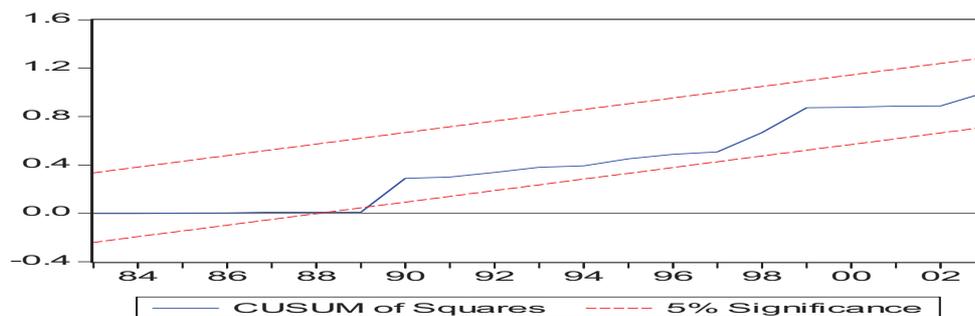


Figure 2. The «CUSUM of Squares » test of the degree of correlation between investment and savings for Thailand

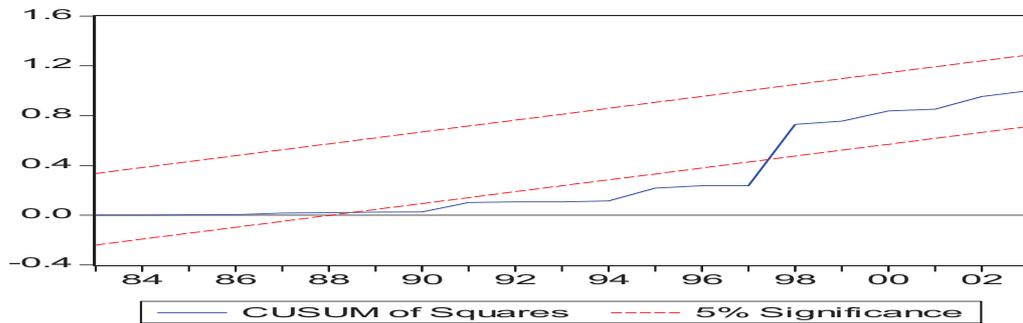


Figure 3. The «CUSUM of Squares » test of the degree of correlation between investment and savings for Malaysia

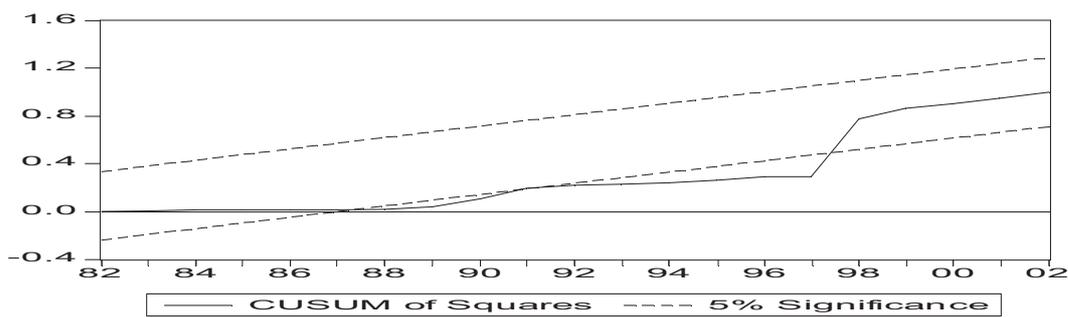


Figure 4. The «CUSUM of Squares » test of the degree of correlation between investment and savings South Korea

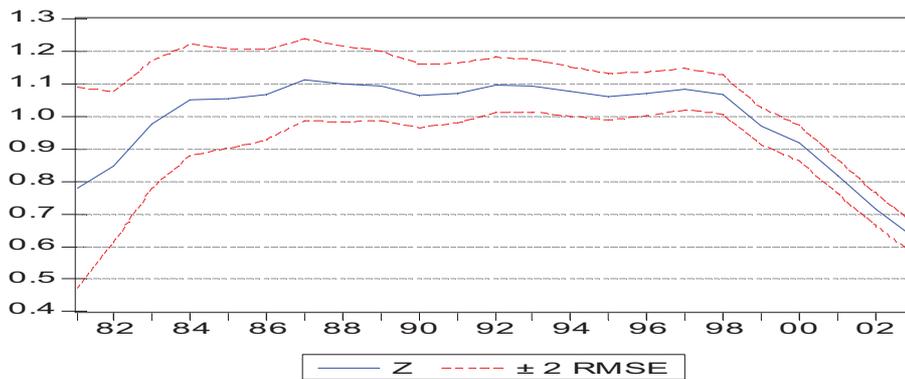


Figure 5. The filtered value of the sensitivity I-S for Indonesia

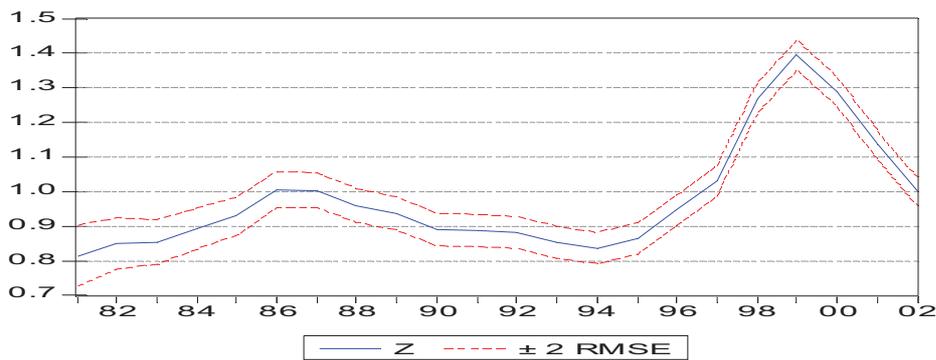


Figure 6. The filtered value of the sensitivity I-S for Thailand

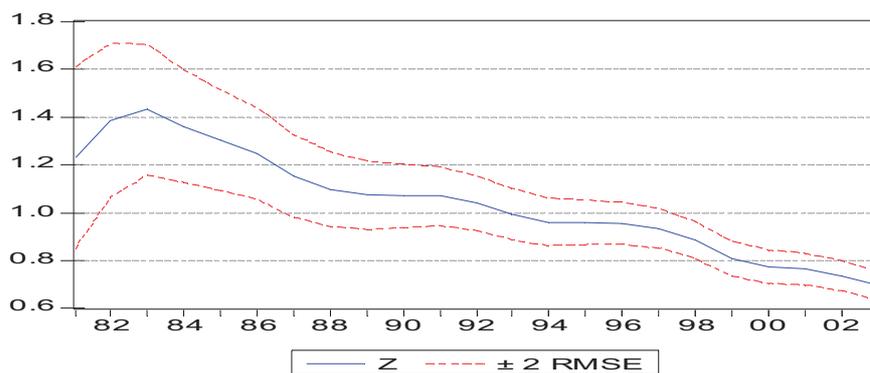


Figure 7. The filtered value of the sensitivity I-S for Malaysia

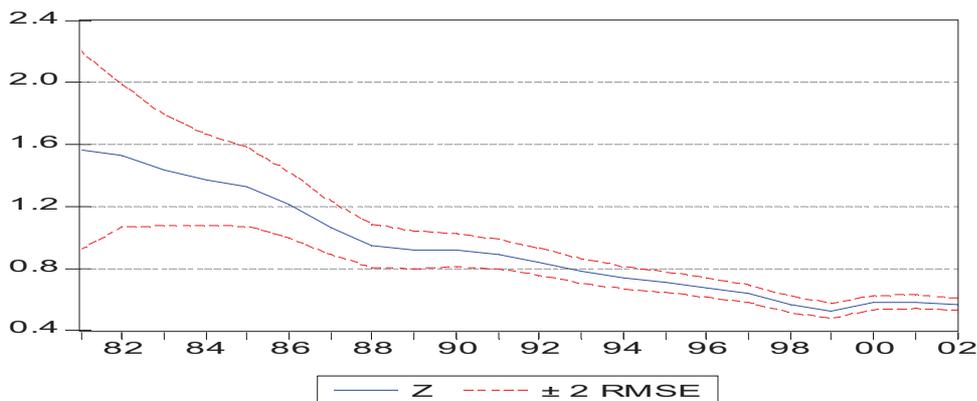


Figure 8. The filtered value of the sensitivity I-S for South Korea

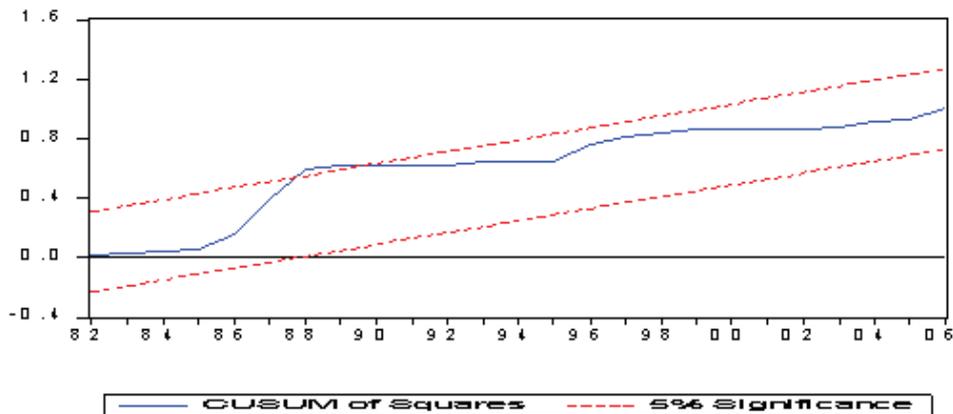


Figure 9. The «CUSUM of Squares » test of the degree of correlation between investments and savings for Tunisia

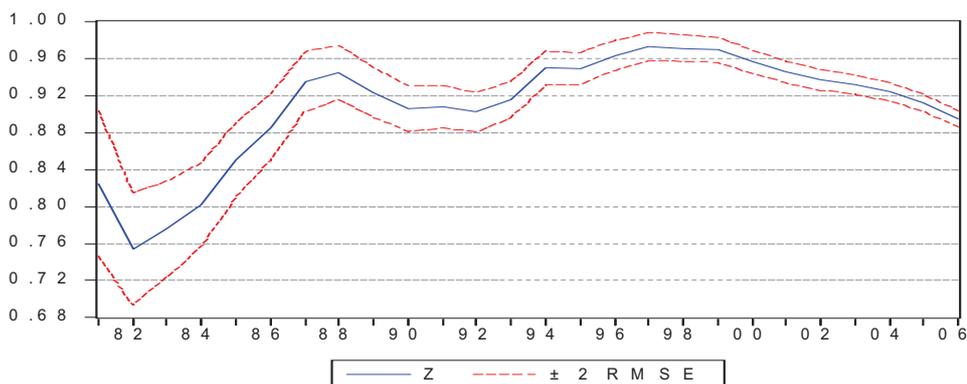


Figure 10. The filtered value of the sensitivity I-S for Tunisia

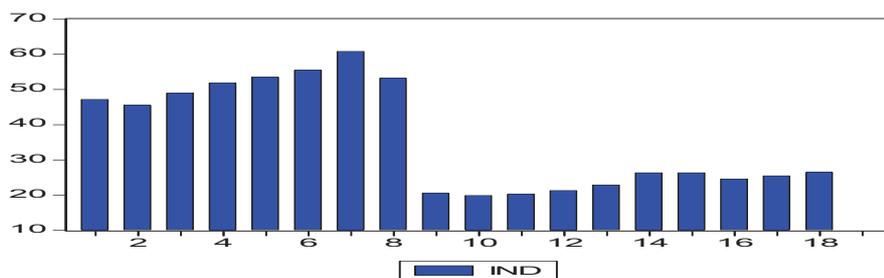


Figure 11. Growth of domestic credits granted to private sector in GDP percentage: Case of Indonesia

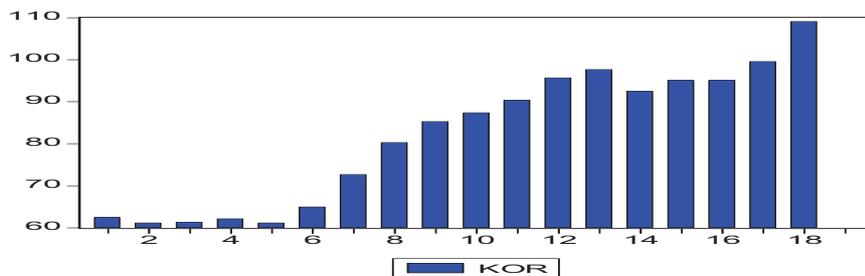


Figure 12. Growth of domestic credits granted to private sector in GDP percentage: Case of Korea (KOR)

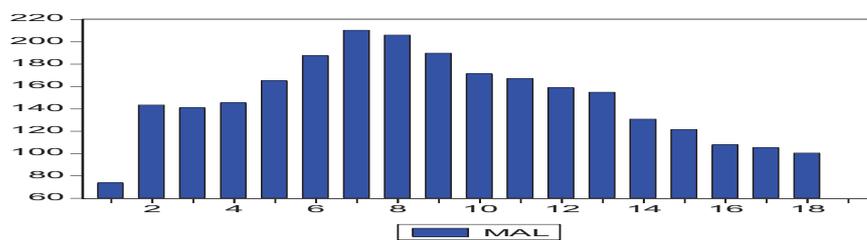


Figure 13. Growth of domestic credits granted to private sector in GDP percentage: Case of Malaysia (MAL)

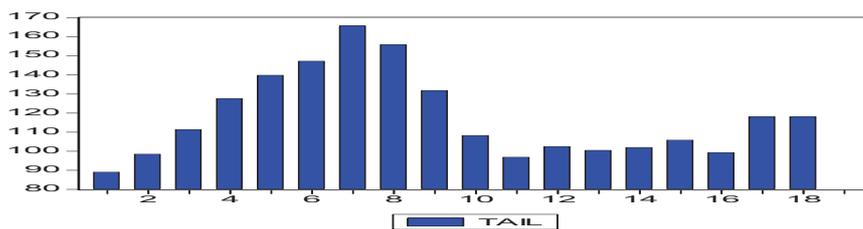


Figure 14. Growth of domestic credits granted to private sector in GDP percentage: Case of Thailand (TAIL)

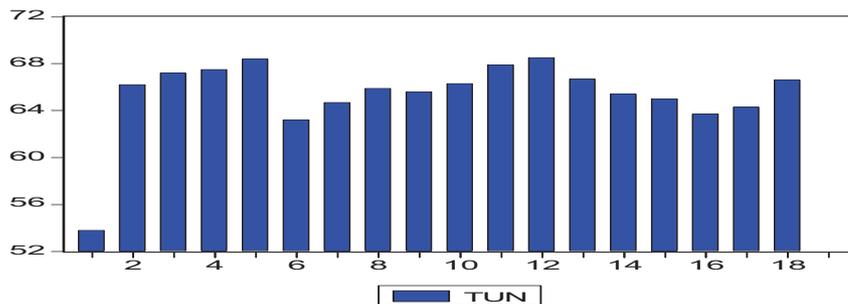


Figure 15. Growth of domestic credits granted to private sector in GDP percentage: Case of Tunisia (TUN)